

WHAT IS CLAIMED IS:

1. A biomember which is a porous body of a calcium phosphates sintered body comprising a number of substantially globular pores (1) and a skeletal part, wherein the skeletal part is compactly sintered, a porosity of the porous body is not less than 55% and not more than 85%, and simultaneously, a mean pore diameter is not less than 50 μ m and not more than 800 μ m, a pore (11) having a size larger than the mean pore diameter has at least three communicating pores (2) having a diameter of not less than 5 μ m, on the average, and simultaneously, a pore having at least the three communicating pores (2) has at least one communicating pore (2) having a diameter of not less than 25 μ m, on the average, and simultaneously, a total opening area of the communicating pore (2) which is possessed by the pore (11) having a size larger than said mean pore diameter occupies the ratio of not more than 50% of a pore surface area on the average, and in a dry state, it is possible to wet the whole by dropping water and blood.

2. A biomember which is a porous body of a calcium phosphates sintered body comprising a number of substantially globular pores (1) and a skeletal part, wherein the skeletal part is compactly sintered, a porosity of the porous body is not less than 65% and not more than 85%, and simultaneously, a mean pore diameter is not less than 100 μ m and not more than 600 μ m, a pore (11) having a size larger than the mean pore diameter has at least four communicating pores (2) having a diameter of not less than 5 μ m, on the average, and simultaneously, a pore having at least the four communicating pores (2) has at least one communicating pore (2) having a

diameter of not less than 50 μ m, on the average, and simultaneously, a total opening area of the communicating pore (2) which is possessed by the pore (11) having a size larger than said mean pore diameter occupies the ratio of not more than 40% of a pore surface area on the average, and in a dry state, it is possible to wet the whole by dropping water and blood.

3. A biomember according to claim 2, wherein the pore (11) having a size larger than the mean pore diameter has at least six communicating pores (2) having a diameter of not less than 10 μ m, on the average, and simultaneously, a pore having at least the six communicating pores (2) has at least two communicating pores (2) having a diameter of not less than 50 μ m, on the average.

4. A biomember according to any one of claims 1 to 3, wherein a sum of a flat area of a pore (11) shown in any plain cross section and having a size larger than the mean pore diameter is not less than 25% and not more than 60% of the flat area of the total cross section.

5. A biomember according to any one of claims 1 to 3, wherein a sum of a flat area of a pore (11) shown in any plain cross section and having a size larger than the mean pore diameter is not less than 35% and not more than 55% of the flat area of the total cross section.

6. A biomember according to any one of claims 1 to 5, wherein when a sintered body which is processed, washed and dried is brought into contact with water or blood without pretreatment, water or blood infiltrates into a core part by a capillary phenomenon.

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7. A biomember according to any one of claims 1 to 6, wherein micro particles of submicron order are used as raw material, and a skeletal part of a sintered body carries grain growth to have a compact skeleton of about 5 micron.

8. A biomember according to any one of claims 1 to 7, wherein a thickness of a circumference part of a communicating pore (2) formed by causing a pore (11) to overlap with a pore (11) having a size larger than the mean pore diameter is set to be of about the thickness of a particle of calcium phosphate.

9. A biomember according to any one of claims 1 to 8, wherein a pore (1) is formed from foaming by stirring a slurry.

10. A biomember according to any one of claims 1 to 9, wherein calcium phosphates sintered body is hydroxyapatite (8).

11. A biomember according to any one of claims 1 to 10, wherein an osteogenic cell, automyelocyte, homogeneous myelocyte, fetal myelocyte, undifferentiated stem cell, osteogenic cell to which a gene of an active factor is introduced, automyelocyte to which a gene of an active factor is introduced, homogeneous myelocyte to which a gene of an active factor is introduced, fetal myelocyte to which a gene of an active factor is introduced, or undifferentiated stem cell to which a gene of an active factor is introduced is introduced into a pore (1).

12. A biomember according to any one of claims 1 to 10, wherein an active material (6) is attached on an inner surface of a pore (1).

13. A biomember according to claim 12, wherein an active material (6) is one chosen from a cell adhesion promoting material, cell proliferation promoting material, osteogenesis promoting material, bone absorption inhibiting material and vascularization promoting material, or combinations of at least two of cell adhesion promoting material, cell proliferation promoting material, osteogenesis promoting material, bone absorption inhibiting material and vascularization promoting material.

14. A biomember according to claim 12 or 13, wherein an osteogenic cell, automyelocyte, homogeneous myelocyte, fetal myelocyte, undifferentiated stem cell, osteogenic cell to which a gene of an active factor is introduced, automyelocyte to which a gene of an active factor is introduced, homogeneous myelocyte to which a gene of an active factor is introduced, fetal myelocyte to which a gene of an active factor is introduced, or undifferentiated stem cell to which a gene of an active factor is introduced is introduced into a pore (1).

15. A biomember according to any one of claims 1 to 10, wherein drugs are stored in a pore (1), and the whole is used as sustained release preparations.

16. A biomember of which a part or the whole of an outer surface of a compact member (21) is made of a porous member (22) consisted of a calcium phosphates sintered body, wherein the compact member (21) has a

porosity of not less than 0% and not more than 15%, the porous member (22) has a porosity of not less than 55% and not more than 85%, and simultaneously, a pore (3) of the porous member (22) is comprised of assembling substantially globular pores (3), a mean pore diameter is not less than $50 \mu\text{m}$ and not more than $400 \mu\text{m}$, the pore (3) having a size larger than the mean pore diameter has at least three communicating pores having a diameter of not less than $5 \mu\text{m}$, on the average, and simultaneously, a pore having at least the three communicating pores has at least one communicating pore having a diameter of not less than $25 \mu\text{m}$, on the average, and simultaneously, the pore (3) having a size larger than the mean pore diameter is opened as the communicating pore in the ratio of not more than 50% of the pore surface area on the average, and the porous member (22) can wet the whole by dropping water and blood in a dry state.

17. A biomember according to claim 16, wherein a compact member (21) is metal or ceramics.

18. A biomember according to claim 16 or 17, wherein an intermediate layer is formed between s compact member (21) and s porous member (22).

19. A biomember according to claim 18, wherein an intermediate layer is comprised of at least one of glass for a living body, calcium phosphate, calcium titanate.

20. A biomember according to claim 19, wherein a porous member (22) is comprised of hydroxyapatite, and an intermediate layer is

hydroxyapatite formed by spray coating.

21. A biomember according to any one of claims 16 to 20, wherein a biomember is an artificial joint, and a porous member (22) is a stem part thereof.

22. A biomember according to any one of claims 16 to 21, wherein an active material is attached to a pore inner surface of a porous member (22).

23. A biomember according to any one of claims 16 to 21, wherein an osteogenic cell, automyelocyte, homogeneous myelocyte, fetal myelocyte or undifferentiated stem cell is introduced into a pore (3) of a porous member (22).

24. A biomember according to any one of claims 16 to 21, wherein an osteogenic cell to which a gene of an active factor is introduced, automyelocyte to which a gene of an active factor is introduced, homogeneous myelocyte to which a gene of an active factor is introduced, fetal myelocyte to which a gene of an active factor is introduced, or undifferentiated stem cell to which a gene of an active factor is introduced is introduced into a pore (3) of a porous member (22).

25. A biomember which has at least compact part (31) and a porous part (32) comprised of a calcium phosphates sintered body, wherein the compact part (31) has a porosity of not less than 0% and not more than 50%, the porous part (32) has a porosity of not less than 55% and not more than

85%, and simultaneously, a pore (3) of the porous part (32) is comprised of assembling substantially globular pores (3), a mean pore diameter is not less than $50\ \mu\text{m}$ and not more than $800\ \mu\text{m}$, the pore (3) having a size larger than the mean pore diameter has at least three communicating pores having a diameter of not less than $5\ \mu\text{m}$, on the average, and simultaneously, a pore having the three communicating pores has at least one communicating pore having a diameter of not less than $25\ \mu\text{m}$, on the average, and simultaneously, the pore (3) having a size larger than the mean pore diameter is opened as the communicating pore in the ratio of not more than 50% of a pore surface area on the average, and at least the porous part (32) can wet the whole by dropping water and blood in a dry state.

26. A biomember according to claim 25, wherein a compact part (31) has a porosity of not less than 0% and not more than 20%.

27. A biomember according to claim 25 or 26, wherein at least a pore (3) of a porous part (32) is formed from foaming by stirring a slurry.

28. A biomember according to any one of claims 25 to 27, wherein a calcium phosphates sintered body is hydroxyapatite.

29. A biomember according to any one of claims 25 to 28, wherein an active material is attached on the inner surface of a pore.

30. A biomember according to any one of claims 25 to 28, wherein at least one of an osteogenic cell, automyelocyte, homogeneous myelocyte, fetal myelocyte and undifferentiated stem cell is introduced into a pore (3).

31. A biomember according to any one of claims 25 to 28, wherein at least one of an osteogenic cell to which a gene of an active factor is introduced, automyelocyte to which a gene of an active factor is introduced, homogeneous myelocyte to which a gene of an active factor is introduced, fetal myelocyte to which a gene of an active factor is introduced and undifferentiated stem cell to which a gene of an active factor is introduced is introduced into a pore (3).

32. A biomember according to any one of claims 25 to 28, wherein drugs are stored in a pore (3).

33. A biomember according to any one of claims 1 to 32, wherein a sintered porous body is a perfectly sintered body that adjacent particles are contacted compactly and grain growth is completed.

34. A biomember according to any one of claims 1 to 33, wherein a sintered porous body is that unevenness is substantially less between particles after sintering, the surface is smooth and the adjacent particles are contacted compactly.

35. A biomember according to any one of claims 1 to 34, wherein a pore wall has a dense microstructure.

36. A method of preparing a biomember claimed in any one of claims 1 to 35, wherein a biomember is obtained by stirring and foaming, then, drying and sintering slurry raw material.

37. A method according to claim 36, wherein a calcium phosphate particle of slurry raw material has a particle diameter such that a mean particle diameter is of submicron order (i.e., not less than $0.1 \mu\text{m}$ and not more than $1 \mu\text{m}$).

38. A method according to claim 37, wherein a maximum particle diameter of a calcium phosphate particle of slurry raw material is of submicron order.

39. A method according to any one of claims 36 to 38, wherein a porous body has a particle diameter of approximately $0.1 \mu\text{m}$ in a dry state, and a particle diameter of approximately $2\text{--}3 \mu\text{m}$ by particle diameter growth after sintering.

40. A method according to any one of claims 36 to 39, wherein a pore shape of a raw material particle is stabilized by cross-polymerizable resin which is polymer.

41. A method according to any one of claims 36 to 40, wherein a submicron particle performs grain growth by sintering to be a particle having a diameter not more than 5 micron, and a skeleton becomes a compact apatite structure by the grain growth.

42. A method according to any one of claims 36 to 41, wherein a porous part (32) comprised of a calcium phosphates sintering body is installed in the compact part (31).